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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/713,929	11/16/2000	Hideki Tai	JP919990195	4074

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On Behalf Of IBM Corporation  
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EXAMINER

KIANERSI, MITRA

ART UNIT	PAPER NUMBER
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2145

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/713,929

Applicant(s)

TAI ET AL.

Examiner

mitra kianersi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) 2 and 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,8 and 9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 11-327276.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) \*
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### ***Response to Arguments***

Applicant's arguments filed on June/21/2004 have been fully considered but they are not persuasive. Applicant on page 5, line 7 argues that the cited art does not teach or suggest the invention and discloses that the present invention provides a novel apparatus and method for managing mobile agents wherein agent servers maintain not only the history of movements of mobile agents at their locations but also keep a count of the accumulated total of movements by each of the mobile server for which the agent servers have a history. In addition, the agent servers maintain requests for updating registration server locations and periodically communicate the requests to the registration server, wherein the requests include the history of movements with the accumulated counts. At the registration server, tables are updated for any given mobile agent using only the information that is accompanied by the highest count of accumulated movements, thereby avoiding updating with stale information. Robertson on [0395] with reference to FIG. 29 discloses entity servers 2902A and 2902B shown with the respective databases 2904A and 2906A for server 2902A, while databases 2904B and 2906B are hosted by server 2902B. In the depicted Figure, each server has two VM containers 2908 and 2910 running, and each container has two NW partition services running within. Partitions 2908 and 2910 are responsible for two main things retrieving one or more instances of a business object and creating a new instance of a business object. Typically, client 2940 would not directly invoke methods of the partition, but would utilize instead a satellite service. Notice that the Figure depicts four entity classes, A-D, representative of, for example, Customer, Account, Billing Address and Pending Order entity classes. Notice also that each of the entity classes is partitioned. With respect to the present Figure, each entity has two partitions, but in practice, most entities would have many more partitions. Each partition is responsible for a plurality of entity instances, which are identifiable by a primary key. Also depicted is registrar 2930, which may be a domain registrar as, described above with respect to FIG. 9. It is expected that the business objects normally used by a client are proximate to that client, thus a fair assumption is that all components represented in FIG. 29 are in a local domain, such as the local domains defined by a multicast radius as further described above with respect to FIG. 9. However, as has been alluded to above, and which will be described in greater detail

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below, a client may interact with business objects located anywhere in the enterprise, locally or non-locally. Thus, servers 2902A and 2902B may or may not be local, while registrar 2930 and finder 2932 are local to client 2940. However, the operations that each of these services perform might lead to hops in other non-local domains.

Applicant on page 6, line 3 argues that Robertson patent publication is method and apparatus for implementing a global lookup for global services. Services are counted in the Robertson system and that the Robertson counting of services, and use of service counts, is not the same as or suggestive of counting the number of accumulated movements of mobile agents. What is taught and claimed by the present invention is agent servers maintaining a history of movements for each of the mobile agents that it encounters and accumulating a count of movements for each of those mobile agents- Clearly the Robertson service count and the claimed movement count are not the same. Robertson on [0270] Lease maintenance, as depicted in the flowchart, is a continuous process that always reverts to an enterprise lease monitoring state (step 1230). Leases remain valid for a predetermined amount of time. That duration of time may be fixed or specifiable by the service making the enterprise lease. Therefore, the registrar must have a sense of time from which to make expiration determinations, for instance, from outputs from the internal CPU oscillator clock. Whenever a lease is created, a counter may be initialized that, based on the duration time of the lease, counts down to a lease expiration event. The lease expiration event may be circumvented by the service renewing the enterprise lease anytime prior to an expiration event. Therefore, the registrar is cognizant of lease creation or extension events and lease expiration events. If, at step 1232, the registrar detects an enterprise leasing or renewal event, the registrar must first identify the service associated with the event (step 1234). Next, the registrar creates or extends the service's enterprise lease by postponing the lease expiration event for a period of time equal to the preset lease duration (step 1238). The process may end here or in accordance with another exemplary embodiment of the present invention, the registrar may determine if the container running the service is being fully utilized (i.e., the threshold amount of threads are currently being processed (step 1240)). Recall that generic service containers are multi-threaded processes allowing many separate service instances to be run in their own threads.

However, if all of the container's threads are used by services, the container cannot support another service and a load error will occur. A threshold number of services may be defined for a container and, whenever the number of services being run exceeds that threshold, the container service simply de-lists itself until some services' leases expire. Thus, if the threshold is not exceeded by the addition of the new enterprise lease, the process reverts to step 1230 where the registrar continues to monitor the enterprise leases. Conversely, if the threshold number of services are now being run in the container, the container can no longer support new services, so the registrar notifies the enterprise repository to make the container service invisible to potential clients (step 1242). It is expected that, in most instances, container services are discovered at the enterprise level most likely by an administrator; thus, the registration must be hidden at least the enterprise level. However, it is also possible that the container service may be discovered at the local domain level so each registration instance of the container service in the local registrars might also be hidden from view, depending upon the discovery process for containers. Once the fully loaded container service is hidden, the process reverts to step 1230.

Applicant on page 7, line 4 argues that counting and comparing number of services is clearly not the same as counting and comparing counts of movements. Robertson on [0295] discloses that the containers should have a sophisticated model for caching entity instances in-core, managing the life-cycle of cached instances as they move in and out of cache and are created and destroyed, management of concurrent access by multiple users, and management of security (access control) and transactions.

Applicant on page 7, line 10, argues that service load does not have anything to do with updating with information containing the higher accumulated number of movements for a given mobile agent. Robertson on [0061] Fig. 24 discloses a diagram showing the event notification approach where the client is using only read-only copies of the entity instance and receiving change notifications whenever an update is received in accordance with an exemplary embodiment of the present invention; Robertson also on [0207] discloses a scavenger daemon is a background service that compares the contents of registrar's lookup table between scheduled checks. Registrar entries for services that have been cleaned up between checks, for whatever reason (i.e., enterprise lease expiration, explicit

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shutdown, etc.), will be communicated to enterprise repository 926. Enterprise repository 926 can then de-list the service from the registrar's address from its directory. If the service has only one associated URL, then the service is completely de-listed from the enterprise repository's lookup and the service will be rendered invisible to potential consumers.

Regarding dependent claims, because the arguments with respect to the allowableness of independent claims were found unpersuasive, these same arguments are not persuasive with respect to the other independent claims.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 2 and 7 are cancelled. Claims 1, 3-6 and 8-9 are rejected under 35

U.S.C. 102(e) as being anticipated by Robertson et al. (US 2002/0178026).

1. As per claim 1, a mobile agent management apparatus comprising: a plurality of agent servers (corresponds to entity servers 2902A and 2902B) and a registration server for maintaining location information mobile agents, (mobile agent approach 0185) and (discover and register with local registrars [0230]) wherein each of said plurality of agent servers comprises: means for maintaining history of movement of each of said mobile agents including a counter for accumulating a count of the accumulated number of movements for each of said mobile agents; (a counter may be initialized that, based on the duration time of the lease, counts down to a lease expiration event. The lease expiration event may be circumvented by the service renewing the enterprise lease anytime prior to an expiration event, [0270]) and (life cycle of cached instances as they move in and out of cache, [0295]) and request means for periodically generating requests for updating location information of each of said agents, (updating the enterprise repository with registration information, [0266])

said requests including at least a mobile agent identifier and said accumulated number of movements for said mobile agent, every object on the ORB has an Interoperable Object Reference (IOR) which is a global identifier string that identifies the machine on which its associated object is located and the interface that the object supports. It has encapsulated the IP, PID and other values required by the client to connect) to renew ion information at said registration server, [0105]).

2. As per claim 3, the apparatus of claim 1, wherein each of said agent servers further comprises comparator means for comparing the in said counter with a predetermined threshold. (Recall that generic service containers are multi-threaded processes allowing many separate service instances to be run in their own threads. However, if all of the container's threads are used by services, the container cannot support another service and a load error will occur. A threshold number of services may be defined for a container and, whenever the number of services being run exceeds that threshold, the container service simply de-lists itself until some services' leases expire. (corresponds to comparing the type and attributes for the services running in the enterprise, [0270])

3. As per claim 4, the apparatus wherein the request generator of each of said agent servers generates a request to registration server for updating location, information when the count of the accumulated number of movements of a corresponding mobile agent exceeds a predetermined threshold. (Recall that generic service containers are multi-threaded processes allowing many separate service instances to be run in their own threads. However, if all of the container's threads are used by services, the container cannot support another service and a load error will occur. A threshold number of services may be defined for a container and, whenever the number of services being run exceeds that threshold, the container service simply de-lists itself until some services' leases expire. (corresponds to comparing the type and attributes for the services running in the enterprise, and when the number of services being run exceeds the threshold, [0270])

4. As per claim 5, the apparatus wherein said registration server comprises at least one register for maintaining accumulated number of movements and locations of each of mobile agents in an associated manner and renews said location information of each of mobile agents only upon receipt of requests for updating location information associated with a higher accumulated number of movements. (updating the enterprise repository with

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registration information, [0266]) and (each time an update to an instance occurs, the counter is incremented [0349].

5. As per claim 6, a method for managing locations of mobile agents by a plurality of agent servers and a registration server for maintaining locations of mobile agents comprising the steps of on each of said agent servers; maintaining history of movement of each of said mobile agents including accumulating a count of the number of movements for each of said mobile agents and (life cycle of cached instances as they move in and out of cache, [0295]) periodically generating requests for updating and deleting registries; said requests including at least a mobile agent identifier and said count of the accumulated number of movements for said mobile agent; and at said registration server, renewing location information of each of said mobile agents kept by said registration server with said requests. (corresponds to updating the enterprise repository with registration information, [0266]).

6. As per claim 8, the method of claim 6, further comprising: comparing said count of the accumulated number of movements to a threshold number of movements. (Whenever a lease is created, a counter may be initialized that, based on the duration time of the lease, counts down to a lease expiration event. The lease expiration event may be circumvented by the service renewing the enterprise lease anytime prior to an expiration event and comparing the type and attributes for the services running in the enterprise, and when the number of services being run exceeds the threshold, [0270])

7. As per claim 9, the method wherein said generating is done when said count of the accumulated number of movements exceeds threshold number of movements. (a scavenger daemon is a background service that compares the contents of registrar's lookup table between scheduled checks. Registrar entries for services that have been cleaned up between checks, for whatever reason (i.e., enterprise lease expiration, explicit shutdown, etc.), will be communicated to enterprise repository 926. [0207] and ((Whenever a lease is created, a counter may be initialized that, based on the duration time of the lease, counts down to a lease expiration event. The lease expiration event may be circumvented by the service renewing the enterprise lease anytime prior to an expiration event and comparing the type and attributes for the services running in the enterprise, and when the number of services being run exceeds the threshold, [0270])



the number of services being run exceeds the threshold, [0270]).

### ***Conclusion***


**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mitra Kianersi whose telephone number is (703) 305-4650. The examiner can normally be reached on 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wiley can be reached on (703) 308-5221. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Mitra Kianersi  
Sept/20/2004

  
**DAVID WILEY**  
**SUPERVISORY PATENT EXAMINER**  
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